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Trends in parent- and teacher-rated emotional, conduct and ADHD problems and their impact in pre-pubertal children in Great Britain: 1999-2008

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Abstract

Background: Evidence from Western countries indicates marked increases in diagnosis and treatment of childhood psychiatric disorders in recent years. These could reflect changes in prevalence of mental health problems, changes in their impact, or increased clinical recognition and help-seeking. Epidemiological cross-cohort comparisons are required to test possible changes in prevalence, but are lacking for pre-adolescent children in Great Britain.

Methods: Parent and teacher Strength and Difficulties Questionnaire (SDQ) ratings were used to compare rates of emotional, conduct and hyperactivity problems in seven-year-old children across three nationally representative British samples assessed in 1999 (n=1,033), 2004 (n=648) and 2008 (n=13,857). The SDQ impact supplement was used to assess associated distress, social, and educational impairment. Stratified analyses examined trends by gender and socio-economic group.

Results: There was a decline in mean problem scores and a fall in the percentages scoring in the 'abnormal' range for all symptom types across the period of study. This decline was observed for all demographic groups, for parent and teacher reports, and was more marked for boys than girls. Both parent- and teacher-rated impact scores differed across the three cohorts for boys. Teacher-rated impact scores differed across cohorts for girls.

Conclusions: The first decade of the 21st Century saw a reduction in perceived levels of emotional and behaviour problems in pre-adolescent children in Great Britain. The threshold at which mental health problems have an impact on children's distress and classroom learning has changed over time. Continued monitoring of child mental health remains a priority.

Introduction

There has been a growing concern that child and adolescent mental health problems may be becoming more common given sharp increases in rates of service use, diagnosis and treatment in many countries (Kessler et al., 2005; Kosidou et al., 2010; Sourander, Niemelä, Santalahti, Helenius, & Piha, 2008). For example, there has been a dramatic increase in diagnosis and treatment of ADHD over recent decades in the US (Getahun et al., 2013; Olfson, Gameroff, Marcus, & Jensen, 2003; Toh, 2006), the UK (Hsia & MacLennan, 2009; McCarthy et al., 2012), and other European countries (Atladóttir et al., 2007; Getahun, et al., 2013; Tick, Van Der Ende, & Verhulst, 2007).

These increases might be explained by increased clinical recognition, changing diagnostic criteria and practice, changes in treatment availability and perceived efficacy, or by increases in the population prevalence of mental health symptoms and their functional impact (Collishaw, 2012). To accurately assess trends in population prevalence, it is necessary to use unselected epidemiological samples. Established child mental health symptom screens have been included in national cohort studies in Great Britain for some decades, allowing for comparisons of ‘like with like’ across time (Green, McGinnity, Meltzer, Ford, & Goodman, 2004; Meltzer, Gatward, Goodman, & Ford, 2000; Plewis, 2007).

Cross-cohort comparisons of British adolescents suggest substantial increases in perceived emotional and behavioural problems from 1974 to 2006 (Collishaw, Maughan, Goodman, & Pickles, 2004; Collishaw, Maughan, Natarajan, & Pickles, 2010; Sweeting, Young, & West, 2009), concurring with similar evidence from other countries (Kosidou, et al., 2010; Sigfusdottir, Asgeirsdottir, Sigurdsson, & Gudjonsson, 2008; Sourander et al., 2004; Tick, van der Ende, & Verhulst, 2008; Wangby, Magnusson, & Stattin, 2005).

Evidence about trends in younger children’s mental health is more limited, and international findings are inconsistent (Achenbach, Dumenci, & Rescorla, 2003; Santalahti, Aromaa, Sourander, Helenius, & Piha, 2005; Sourander, et al., 2008; Sourander, et al., 2004; Tick, et al., 2007). This may be due to methodological differences between studies, or they might reflect cross-cultural variations in trends in child psychopathology (Crijnen, Achenbach, & Verhulst, 1997; Heiervang, Goodman, & Goodman, 2008).

To our knowledge, only two cross-cohort comparisons assessing trends in preadolescent children’s mental health have been undertaken in Great Britain. A study examining trends in the North East of England from 1973 to 1994 found a decrease in both emotional and behavioural symptoms, whilst hyperactivity symptoms remained stable

(McArdle, Prosser, Dickinson, & Kolvin, 2003). A study utilising two national British samples extended these findings comparing children's mental health in 1999 and 2004 (Maughan, Collishaw, Meltzer, & Goodman, 2008). Findings suggested that the prevalence of most problems remained stable, or showed a small reduction across this period. There is no information on UK population-level trends in children's mental health beyond this time despite increasing rates of service use and treatment in the last decade (Hsia & MacLennan, 2009; McCarthy, et al., 2012). Cross-cohort comparisons in relation to functional impact of mental health symptoms are also lacking.

The aims of the current study were to:

- Describe trends in parent- and teacher-rated child emotional, conduct, and hyperactivity problems in three nationally-representative British samples assessed in 1999, 2004 and 2008
- Test whether changes in population demographics account for any trends in child mental health
- Examine whether trends in parent- and teacher-rated impact of mental health problems has changed across time

It is unclear whether the prevalence of child mental health problems has changed since 2004, or whether the perceived impact of child mental health problems has changed in that time. We therefore had no formal hypotheses in relation to trends in child mental health problems.

Method

Samples and design

Three nationally representative samples of seven-year-old children in Great Britain were compared: the British Child and Adolescent Mental Health Surveys (BCAMHS) undertaken in 1999 and 2004 and the Millennium Cohort Study (MCS) assessed in 2008. Analyses focused on children living in England, Scotland and Wales.

BCAMHS 1999 and 2004: Cross-sectional samples of children aged 5–15 years in 1999 and 5–16 years in 2004 were ascertained using the Child Benefit Register as a sampling frame with a clustered design by postal sector (Green, et al., 2004; Meltzer, et al., 2000). The sampling frame was estimated to represent 90% or more of British children (Meltzer, et al., 2000). Information was collected on 83% and 76% of eligible families approached for interview in 1999 and 2004 respectively. This study focuses on 7 year-olds from each sample

(BCAMHS 1999, $n = 1033$; BCAMHS 2004, $n = 648$). Parental information was available for 99% (1999: $n = 1025$; 2004: $n = 642$) and teacher reports for 81% of children in 1999 ($n = 838$) and 79% in 2004 ($n = 513$).

MCS 2008: MCS is a longitudinal birth cohort of children born between September 2000 and January 2002 in England, Wales, Scotland and Northern Ireland (Plewis, 2007). We restricted analyses to families living in Great Britain to be comparable with the 1999 and 2004 cohorts. The MCS design included over-sampling of areas with high proportions of ethnic minorities, areas of high child poverty, and Scotland and Wales. Standard analytic procedures (developed for use with MCS; Plewis, 2007) are used to ensure results are representative of the British population as a whole (see below). Here we focus on the fourth data collection sweep (age 7 years, $n = 13,857$, 72% of issued sample). Parent reports were available for 97% of participating children ($n = 13,472$); teacher reports for 63% ($n = 8,732$).

For each cohort, consent was given at the interview for anonymised responses to be used for research purposes.

Demographic information for each cohort at age 7 is summarised in table 1. As shown, the proportion of children from ethnic minority groups increased with each successive cohort, there was a higher proportion of single parents in 2004 compared to the other cohorts, and in 2008 there were fewer dual-earner households. Additional analyses examined sample characteristics for teacher-based reports. Though teacher reports were more often available in the first two cohorts, there were no differences in the characteristics of the teacher-report samples relative to the more complete parent-report samples (results available on request).

Design and attrition weights

Non-response is inevitable in studies such as these (Wadsworth et al., 2003), but it is important to take this into account to ensure that findings are representative. For BCAMHS 1999 and BCAMHS 2004, weights were developed by the original survey team to take into account the differential probability of selection by country, variations in response by region and to represent the age-sex structure of the national population of children and adolescents. MCS 2008 included sample weights to correct for families in different wards having an unequal probability of selection (resulting from the stratified cluster sample design), and to adjust for non-response. More details about design/attrition weights, and for the

representativeness of the three cohorts is provided elsewhere (Green, McGinnity, Meltzer, Ford, & Goodman, 2005; Meltzer, et al., 2000; Plewis, 2007).

Measures

Child behaviour and emotional problems

Parents and teachers completed the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997), a 25-item questionnaire which has been extensively validated for use as a screen for child psychopathology in the general population and in clinical populations (Stone, Otten, Engels, Vermulst, & Janssens, 2010). Items are coded 0 (not true), 1 (somewhat true) or 2 (certainly true). Information is combined into subscales of five items each, including emotional problems, conduct problems, and hyperactivity problems. A total problem score was calculated by summing these three subscales together with a peer problems subscale. Children scoring in the abnormal range for the SDQ total and subscale scores were identified using published norms and standardised cut-offs ((Goodman & Goodman, 2009; Goodman, 1997) parent reports: emotional problems=5-10, conduct problems=4-10, Hyperactivity=7-10, total difficulties=17-40; teacher reports: emotional problems= 6-10, conduct problems=4-10, Hyperactivity=7-10, total difficulties=16-40).

Impact scores

The SDQ includes an impact supplement to assess overall distress, and social and educational impairment (Stringaris & Goodman, 2013). For children with difficulties, parents and teachers were asked one item about level of child distress, and up to four items about interference of the child's emotional/behavioural problems with family life, leisure activities (both items parent only), friendships, and classroom learning (all scored 0 to 2). Impact scores ranged from 0 to 10 for parents, and from 0 to 6 for teachers.

Demographic information

Information was collected regarding child gender, family type (single parent family, reconstituted family, intact family), number of children in the household, housing tenure (mortgage or owned vs. rent or other), maternal education (leaving school at the minimum age), income (defined as population quintiles within each cohort), current employment status (both parents working, one parent working, neither parent working), and ethnicity (white British or other).

Analysis strategy

For cohort comparisons of SDQ subscales and total problems scores, we report means and standard deviations separately for boys and girls. Differences in mean values between the three cohorts were tested using ANOVA. We report F statistics but, in view of the size of the cohorts and thus very large denominator degrees of freedom, display only the numerator degrees of freedom for each hypothesis test.

We also tested for gender-by-cohort interactions to examine whether trends differed for boys and girls. Cohen's d statistic provides an estimate of the effect size of the differences in means across the study period (1999-2008). We tested for changes in variance across the three cohorts using the variance-comparison test. The percentage of children with scores in the 'abnormal' range was compared using chi-square statistics. We conducted multivariate analysis to test whether cohort differences in parent- and teacher-rated total difficulties scores were still evident once any socio-demographic changes had been taken into account. There was insufficient power to explore trends for specific ethnic minority groups. To test sensitivity of findings to possible changes in ethnic composition of the population, analyses were repeated restricted to those who identified themselves as 'White British'. Findings were equivalent and so results from the complete samples are presented. Finally, we tested whether the impact of mental health problems had changed across time (for subgroups scoring in the abnormal range of the total SDQ). Analyses were conducted in Stata version 13 using the survey command and sample-specific weights to account for survey design and sample attrition.

Results

Cross-cohort change in SDQ symptom scores

Cross-cohort comparisons examined trends in mental health problems in boys and girls separately. Means and standard deviations for each outcome measure and each informant are shown in Table 2. Effect size estimates for change between 1999 and 2008 are also shown.

Total problem scores: Parent-rated total problem scores for boys differed between cohorts ($F(2)=15.87$, $p<.001$) and were significantly lower in 2008 (mean 8.39, 95% CI 8.24-8.53) than 1999 (mean=9.89, 95% CI 9.33-10.45) or 2004 (mean=9.24, 95% CI 8.55-9.94). Parent-rated total problem scores for girls were also significantly different between cohorts ($F(2)=3.63$, $p=.026$) and were significantly lower in 2008 (mean=6.99, 95% CI 6.86-7.12) than 1999 (mean=7.64, 95% CI 7.19-8.10). A significant interaction between gender and cohort ($F(5)=3.60$; $p=.027$) indicated a greater drop in parent-reported problems for boys than for girls ($d= 0.27$ and $d= 0.12$ respectively). Teacher-rated total problem scores also differed

for boys ($F(2)=3.46$, $p=.031$), but not for girls ($F(2)=1.03$, $p=.357$), although there was no significant gender by cohort interaction ($F(5)=0.62$; $p=.541$). Pair-wise comparisons indicated that boys total problems declined between 1999 (mean=8.33, 95% CI 7.70-8.97) and 2008 (mean=7.43, 95% CI 7.17-7.69).

Emotional problems: Parent-rated emotional problem scores for boys were significantly different between cohorts ($F(2)=18.42$, $p<.001$), and were lower in 2008 (mean=1.54, 95% CI 1.49-1.58) compared with either 1999 (mean=2.03, 95% CI 1.85-2.21) or 2004 (mean=1.84, 95% CI 1.62-2.06). Parent-rated emotional problem scores for girls were also significantly different between cohorts ($F(2)=4.51$, $p=.011$) and were significantly lower in 2008 (mean=1.60, 95% CI 1.56-1.64) than 1999 (mean=1.81, 95% CI 1.65-1.97). A greater decrease in symptoms was observed for boys than for girls (cohort x gender interaction: $F(5)=2.99$; $p=0.040$; $d=0.27$ vs. $d=0.12$). Teacher reports of emotional problems did not differ across cohorts for either boys ($F(2)=0.04$, $p=.961$; $d=0.02$) or girls ($F(2)=0.58$, $p=.561$; $d=0.04$).

Conduct problems: Parent- and teacher-rated conduct problem scores for boys were significantly different between cohorts (parent-rated: $F(2)=9.87$, $p<.001$; teacher-rated: $F(2)=5.93$, $p=.002$). Boys' conduct problems reduced between 1999 and 2008 (parent-rated: 1999 mean=1.96, 95% CI 1.79-2.12; 2008 mean=1.62, 95% CI 1.57-1.66; Teacher-rated: 1999 mean=1.37, 95% CI 1.17-1.57; 2008 mean=1.04, 95% CI 0.95-1.10). Parent- and teacher-rated conduct problem scores for girls were also significantly different between cohorts (parent-rated: $F(2)=4.22$, $p=.015$; teacher-rated: $F(2)=3.14$, $p=.043$). Girls' conduct problems reduced between 1999 and 2008 (parent-rated: 1999 mean=1.48, 95% CI 1.35-1.61; 2008 mean=1.28, 95% CI 1.24-1.32; teacher-rated: 1999 mean=0.71, 95% CI 0.57-0.85; 2008 mean=0.56, 95% CI 0.48-0.59). Trends did not vary by gender (gender by cohort interactions, $p > 0.1$).

Hyperactivity: Parent-rated hyperactivity problem scores for boys were significantly different between cohorts ($F(2)=5.71$, $p=.033$) and were lower in 2008 (mean=3.89, 95% CI 3.82, 3.95) compared with either 1999 (mean=4.29, 95% CI 4.03-4.55) or 2004 (mean=4.11, 95% CI 3.81-4.42). Parent-rated hyperactivity problem scores for girls were not significantly different between cohorts ($F(2)=1.15$, $p=.318$). Teacher reports of hyperactivity problems also differed across cohorts for boys ($F(2)=3.55$, $p=.044$; $d=.12$) but not girls ($F(2)=0.91$, $p=.404$; $d=.03$). Boys hyperactivity scores reduced from 1999 (mean=4.08, 95% CI 3.88-4.40) to 2008 (mean=3.71, 95% CI 3.60-3.85). Tests of the gender by cohort interaction

indicated differential trends by gender in parent-rated ($p = 0.022$) but not teacher-rated hyperactivity ($p > 0.2$).

Changes in population variance

F-tests for equality of variance showed significant decreases in variance between 1999 and 2008 for parent- and teacher-rated total problem and subscale scores (all $p < 0.05$ except teacher-reported hyperactivity problems $p = 0.123$; see also Table 2).

Do changes in population demographics account for trends in child mental health?

Table 3 shows unadjusted estimates of change in total problem scores (model 1) and adjusted for differences in socio-demographic factors (model 2). Measures of socio-demographic disadvantage (family type, family size, tenure, maternal education, income, parental employment) were associated with teacher and/or parent rated problem scores, but controlling for these did not attenuate estimates of change in problems by cohort (Table 3, model 2).

Percentage of children scoring in the abnormal range

The proportion of children who scored in the ‘abnormal’ ranges of the SDQ reduced over time (Figure 1). Parent reports of abnormal-range total problems ($\chi^2(1) = 8.94$, $p = .003$), emotional problems ($\chi^2(1) = 13.93$, $p < .001$), conduct problems ($\chi^2(1) = 17.50$, $p < .001$) and hyperactivity ($\chi^2(1) = 12.98$, $p < .001$) were all less frequent in 2008 than 1999 (Figure 1, panel A). According to teachers, the proportion of children with abnormal range total SDQ scores also showed a small reduction (from 11% in 1999 to 9% in 2008; Figure 1, panel B; $\chi^2(1) = 4.54$, $p = .033$). The proportion with abnormal range conduct problems ($\chi^2(1) = 15.67$, $p < .001$) also reduced, but rates with abnormal range emotional problems ($\chi^2(1) = 2.00$, $p = .157$) or hyperactivity ($\chi^2(1) = 1.39$, $p = .238$) did not change.

Parent- and teacher-rated impact of child mental health problems

Impact scores were examined for children with scores in the ‘abnormal’ range of the total SDQ (table 4). Both parent- and teacher-rated impact scores differed across the three cohorts for boys (parent $F(2) = 4.19$, $p = .016$; teacher $F(2) = 2.87$, $p = .047$). Pair-wise comparisons indicated that parent-rated impact increased between 1999 and 2004 (and then decreased), whilst teacher-rated impact increased between 1999 and 2008. There were no significant differences in parent-reported impact scores for girls ($F(2) = 0.23$, $p = .798$), but teacher-rated impact did increase ($F(2) = 4.40$, $p = .014$). We examined whether specific aspects of impact had changed across time. For boys, parent reports revealed an increase in the

impact of child problems on classroom learning, friendships, family relationships, and leisure. Teacher reports also revealed an increase in child distress. For girls, parent reports revealed an increase in the impact of child problems on leisure activities. Teacher reports also revealed an increase in impact on classroom learning (see supplementary table 1).

Discussion

This study examined change in the population prevalence of common child mental health problems in the first decade of the 21st Century in Great Britain. This period saw marked changes in service use, diagnosis and treatment of child psychiatric problems in clinical practice (Hsia & MacLennan, 2009; McCarthy, et al., 2012). Our findings suggest that these changes do not reflect a population-wide increase in prevalence of common child mental health symptoms in seven-year-olds. Our study using three large unselected population cohorts suggests overall improvements in child mental health symptom scores over this period. Similar conclusions derived from parent and teacher reports, and for average and clinical-range symptom scores.

Our study updates two previous reports indicating little change in the prevalence of British pre-adolescent children's mental health problems (Maughan, et al., 2008; McArdle, et al., 2003). A noteworthy and novel finding was that whilst overall problem levels reduced, the perceived impact of emotional and behavioural problems increased. In particular, where children were rated as having difficulties, parents and teachers reported greater impairment in children's adaptation in the more recent cohorts. One possibility is that parent and teacher perceived functional impairment and burden are linked to increased help-seeking from health professionals (Angold et al., 1998; Goodman, 1999), though how far this explains the rapid increase in clinical diagnoses of child psychiatric problems remains to be tested.

The findings contrast with evidence of longer-term increases in symptoms observed among adolescents (Collishaw, et al., 2004; Sweeting, et al., 2009). It is uncertain whether this is due to different time periods under consideration, or whether different explanatory factors account for trends in child and adolescent mental health.

Comparisons with other international studies of child mental health trends are also important. A Dutch study of 8-year old children found that parent reports of child problems did not show a significant increase from 1989 to 2005 (Sourander, et al., 2008). A Dutch study of 6 to 16 year old children found evidence for small increases in population levels of parent-reported problems from 1983 to 2003 (Tick, et al., 2007). An American study of 7 to

16 year old children found that problems scores increased from 1976 to 1989 and then decreased in 1999 but remained higher than in 1976 (Achenbach, et al., 2003). However, differences in findings may reflect differences in timing, measures, or they may reflect cross-cultural variations in trends in child psychopathology (Crijnen, et al., 1997; Heiervang, et al., 2008).

Addressing possible explanations for the population-level *decrease* in children's mental health symptoms was beyond the scope of this study. However, the present findings do provide some important pointers. First, decreases in symptom scores were evident among boys, suggesting that secular change in gender-specific influences on risk for child psychopathology may be relevant. It is worth noting here that a number of studies have reported that gender differences in the prevalence of child and adolescent mental health problems have narrowed over recent decades (Achenbach, et al., 2003; Sourander, et al., 2004). Second, cross-cohort differences were not reduced when changes in the socio-demographic profiles of the three cohorts were taken into account. Factors including family composition, family size, maternal education, and parental employment status were each associated with child problems *within* cohorts but did not account for cross-cohort variations. Third, the ethnic composition of the British population continues to change, but this also did not account for the changes we observed, as findings were closely similar when restricted to those of 'White British' origin. Fourth, most studies have only reported trends in mean symptom levels. It is also important, however, to examine changes in population variance. For example, an increase in population variance might mean that there are more children with extreme scores (von Soest & Wichstrøm, 2013). The current findings suggest this has not been the case. Variance in symptom scores reduced, and there were fewer children scoring above the clinical cut-points on the parent and teacher SDQs.

Additional research is needed to test other potential explanations for the reduction in child mental health symptoms over this period, including socio-economic and policy changes that might have impacted on child mental health. The period 1999-2008 saw improving economic conditions in the UK, and a fall in child poverty (Brewer, Browne, Joyce, & Sibieta, 2010). There is evidence that the alleviation of family poverty can have beneficial effects on children's outcomes (Cooper & Stewart, 2013). Other policy changes during the course of the study might also be relevant, though direct evidence to evaluate these possibilities is lacking. For example, public spending on early years and primary school education in the UK increased (Chowdry & Sibieta, 2011), the UK government launched the 'Every Child Matters' initiative in 2003, providing a legal framework for promoting

children's physical and mental health (Department for Education, 2003), and evidence-based parenting interventions also saw increased funding and support (Belsky, Melhuish, Barnes, Leyland, & Romaniuk, 2006; Meadows, 2006). Finally, given improvements in pre-, peri- and neonatal health (Field, Dorling, Manktelow, & Draper, 2008; World Health Organisation, 2012), it is important to examine whether these factors contributed to observed changes in child mental health. Finally, research is also needed that examines longer-term change in child mental health. It remains uncertain whether reductions in child mental health symptom levels observed since 1999 have followed a period of longer-term increase in problems. Temporal change in rates of risk and protective factors that mirrors change in child mental health might be particularly relevant for understanding what accounts for child mental health trends.

Strengths and limitations

The current study utilised three large epidemiological samples, all of which used the same assessments of child mental health. The equivalence of samples and measurement ensured that we were able to directly assess changes in population prevalence, in contrast to reports based on diagnoses, treatment or service use. In addition, the study benefitted from multi-informant reports from both parents and teachers.

There are also important limitations. First, each cohort faced some attrition. Sample-specific attrition weights were used to address selective non-response, and the demographic profile of the three analysed samples has been shown to be broadly representative of the general population in each case (Green, et al., 2005; Meltzer, et al., 2000; Plewis, 2007). Second, there is the possibility of a systematic change in *reporting* of mental health problems over time. In general, it has been assumed that parents have become more willing to report symptoms of emotional or behavioural disturbance than in the past. However, this would have led to an increase in reported problems across time; the findings here show the opposite. It would also perhaps be surprising if any changing biases in study retention or reporting varied systematically by child gender. Nevertheless, independent validation of the trends we identified would be desirable, using for example follow-up standardized measurement of psychopathology or functional impairment later in development. Finally, this study was unable to assess changes in prevalence of child psychiatric *disorders*, focusing instead on common emotional and behavioural symptoms and their impact on children's functional adaptation.

The current study provides important new evidence that the sharp increase in child mental health problems seen in clinical practice are not paralleled by a general shift in the population prevalence of child mental health symptoms. The increases in rates of service use, diagnosis and treatment are likely to reflect changing impact of symptoms, changes in diagnostic practice, better monitoring and increased awareness. The findings highlight the possibility that even though absolute levels of symptoms are declining, the threshold at which they have an effect on children's distress and classroom learning may have become lower over time. This might reflect societal expectations as well as demands, for example expected levels of performance in class. The global economic crisis began just after the time of the most recent assessment included in this study, and has already been shown to be linked with a sudden increase in adult suicides in 2009 onwards (Chang, Stuckler, Yip, & Gunnell, 2013). We are not aware of any British national cohorts of preadolescent children post-recession. Finally, despite a modest reduction in child mental health symptoms at the beginning of the 21st Century, child psychiatric problems remain common and very often remain unrecognised (Ford, Goodman, & Meltzer, 2003). Continued monitoring of child mental health is thus a priority.

Key Points

- There have been marked increases in diagnosis and treatment of childhood psychiatric disorders in recent years. These could reflect changes in prevalence of mental health problems, changes in their impact, or increased clinical recognition and help-seeking.
- In three nationally representative samples of 7 year-olds we found that there has been a decline in mean problems scores for all symptoms types across the study period (1999 to 2008) for all demographic groups. This decline was more marked for boys than girls.
- Both parent- and teacher rated impact scores differed across the three cohorts for boys. Teacher-rated impact scores differed across cohorts for girls.
- The threshold at which mental health problems have an impact on children's distress and classroom learning has changed over time. Continued monitoring of child mental health remains a priority.

Tables and figures

Table 1: Comparison of demographic indicators across the three study cohorts

	BCAMHS 1999 N = 1033	BCAMHS 2004 N = 648	MCS 2008 N = 13857	Chi square p
Child gender (female)	53.5	50.6	48.6	$\chi^2(2)=4.4$ p=.113
Family composition				
Intact (2 biological parents)	71.2	62.8	70.2	$\chi^2(4)=28.9$ p=<.001
Reconstituted	7.6	7.7	7.7	
Single	21.2	29.3	22.2	
Ethnicity				
White	91.0	86.9	85.1	$\chi^2(2)=11.0^a$ p<.001
Black	2.4	3.9	3.4	
Indian/Pakistani/Bangladeshi	4.0	6.8	6.8	
Other	2.6	2.4	2.5	
Country				
England	84.1	89.8	85.0	$\chi^2(4)=79.6$ p=<.001
Scotland	10.4	7.6	9.7	
Wales	5.5	2.6	5.3	
Housing Tenure				
Own/Mortgage	65.2	66.9	65.8	$\chi^2(2)=0.5$ p=.767
Rent/other	34.8	33.1	34.2	
Family economic status				
Both parents working	61.1	60.8	48.8	$\chi^2(4)=109.5$ p=<.001
One parent working ^b	25.0	20.8	35.0	
No parent working ^b	14.0	18.4	16.1	
Mother stayed at school beyond minimum leaving age	88.8	91.5	88.8	$\chi^2(2)=4.4$ p=.109
Household size				
1 child	14.6	14.0	13.1	$\chi^2(8)=7.3$ p=.505
2 children	45.4	47.5	45.8	
3 children	27.0	24.7	26.7	
4 children	9.6	9.6	9.8	
5+ children	3.4	4.2	4.7	

Abbreviations: BCAMHS British Child and Adolescent Mental Health Survey; MCS Millennium Cohort Study.

N.B. Weighted for attrition and sampling

^a Comparing white vs other ethnic groups

^b Including lone parent families

Table 2: Parent- and teacher-reported SDQ scores by gender and cohort

		Parent reports					Teacher reports				
		BCAMHS 1999 Mean (sd)	BCAMHS 2004 Mean (sd)	MCS 2008 Mean (sd)	Cohort Differences	d' (08 vs 99)	BCAMHS 1999 Mean (sd)	BCAMHS 2004 Mean (sd)	MCS 2008 Mean (sd)	Cohort Differences	d' (08 vs 99)
subscale											
Total	Boy	9.89 (6.20)	9.24 (6.26)	8.39 (5.86)	1,2>3	.27	8.33 (6.31)	7.31 (5.97)	7.43 (6.12)	1>2,3	.15
	Girl	7.64 (5.42)	7.11 (5.10)	6.99 (5.10)	1>3	.12	5.79 (5.59)	5.36 (5.21)	5.39 (5.33)	ns	.07
Emotional	Boy	2.03 (1.95)	1.84 (2.01)	1.54 (1.83)	1,2>3	.27	1.37 (2.00)	1.41 (1.87)	1.41 (1.93)	ns	.02
	Girl	1.81 (1.91)	1.79 (1.88)	1.60 (1.74)	1>3	.12	1.49 (2.10)	1.67 (2.08)	1.55 (1.98)	ns	.04
Conduct	Boy	1.96 (1.83)	1.81 (1.88)	1.62 (1.69)	1,2>3	.22	1.37 (1.98)	1.11 (1.68)	1.04 (1.73)	1>3	.21
	Girl	1.48 (1.57)	1.31 (1.46)	1.28 (1.44)	1>3	.13	0.71 (1.52)	0.54 (1.30)	0.56 (1.25)	1>3	.10
Hyperactivity	Boy	4.29 (2.87)	4.11 (2.77)	3.89 (2.62)	1>3	.16	4.08 (3.16)	3.59 (3.02)	3.71 (2.98)	1>3	.12
	Girl	3.06 (2.51)	2.80 (2.54)	2.98 (2.38)	ns	.03	2.25 (2.40)	1.99 (2.32)	2.15 (2.43)	ns	.03

Cohort differences indicates significant pair-wise comparisons. ¹ BCAMHS 1999; ² BCAMHS 2004; ³ MCS 2008. d' refers to Cohen's effect size for comparison of first and last cohort (1999 and 2008).

Table 3. Cross-cohort comparisons in total SDQ scores, unadjusted (model 1) and adjusted for socio-demographic measures (model 2)

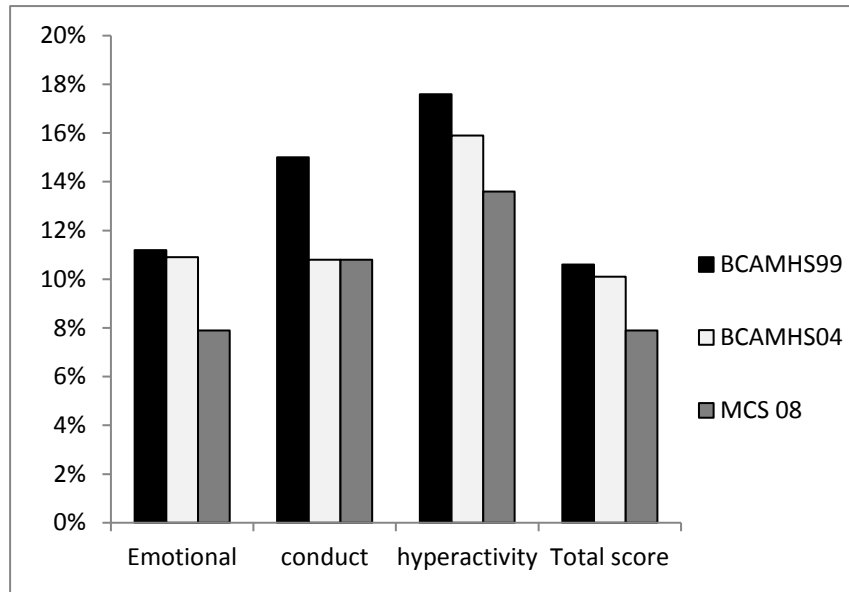
		Parent SDQ total		Teacher SDQ total	
		B (95% CI)	p	B (95% CI)	p
Model 1	Cohort	-0.52 (-.70, -.33)	<.001	-0.25 (-.46, -.04)	.018
Model 2	Family composition	0.14 (-.04, .31)	.137	0.56 (.31, .80)	<.001
	No. of children in household	-0.07 (-.20, .07)	.333	-0.29 (-.46, -.12)	.001
	Housing tenure ^a	1.27 (.93, 1.60)	<.001	1.15 (.73, 1.56)	<.001
	Mother left school at minimum age	0.98 (.54, 1.43)	<.001	0.21 (-.32, .75)	.439
	Household income	-0.60 (-.70, -.50)	<.001	-0.34 (-.47, -.20)	<.001
	Unemployed	0.38 (.17, .58)	<.001	0.31 (.05, .58)	.021
	Cohort	-0.68 (-.86, -.50)	<.001	-0.36 (-.57, -.15)	<.001

^a 0=own property; 1= rented accommodation

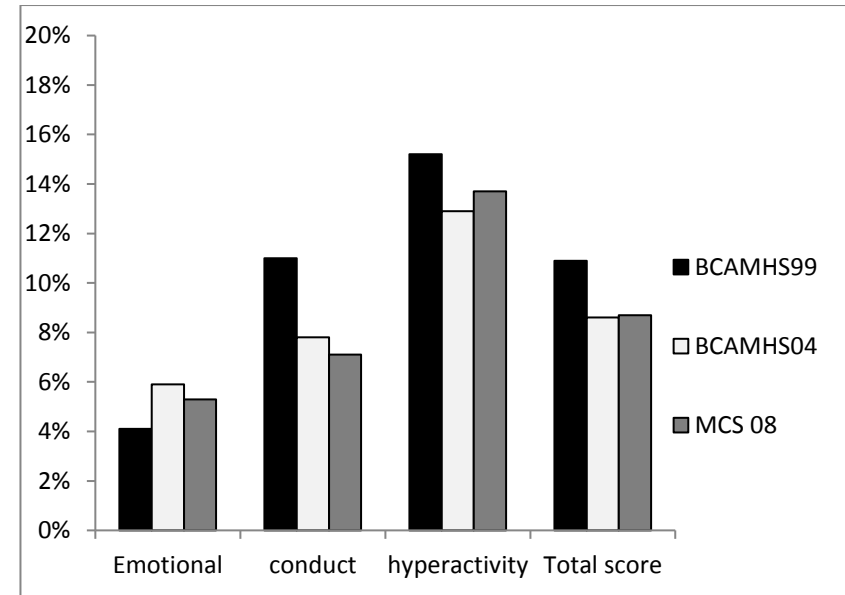
Table 4: Parent- and teacher-rated impact for children scoring in the abnormal range by gender and cohort

		Mean impact scores (sd)				
		BCAMHS	BCAMHS	MCS	Cohort	d' (08 vs 99)
		1999	2004	2008	differences	
		Mean (sd)	Mean (sd)	Mean (sd)		
Parent reports	Boy	2.35 (2.45)	4.05 (3.01)	3.10 (2.87)	1,3<2	.26
	Girl	2.10 (2.75)	2.59 (3.60)	2.13 (2.29)	ns	.01
Teacher reports	Boy	2.17 (1.31)	2.97 (1.54)	2.73 (1.59)	1<3	.35
	Girl	2.36 (1.34)	1.76 (1.52)	2.67 (1.63)	2<3	.19

Cohort differences indicate significant pair-wise comparisons. ¹ BCAMHS 1999; ² BCAMHS 2004; ³ MCS 2008. d' refers to Cohen's effect size for comparison of first and last cohort (1999 and 2008).



Panel a



Panel b

Figure 1: percentage of sample in the abnormal range by parent (panel a) and teacher (panel b) reports within each cohort

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